Section II. REMARKS

Request for Correction of Errors in the May 5, 2004 Office Action

The Office Action Summary of the May 5, 2004 Office Action erroneously states that "claim(s) 1-33, 38-45 and 50-56 is/are withdrawn from consideration."

Claims 1-33, 38-45 and 50-56 have never been withdrawn in this application, and Applicants therefore request the Office to correct such error in the Office Action Summary.

The May 5, 2004 Office Action made rejections to claims 1-33, 38-45 and 50-56 on page 2, second paragraph.

However, Applicants have filed a Response on April 22, 2004 and cancelled claims 15, 20, 56, and 57 therein. Therefore, only claims 1-14, 16-19, 21-33, 38-45 and 50-55 are correctly pending in the present application, and the Office is hereby requested to correct such error on page 2 of the Office Action.

Response to the §103 Rejection of Claims

In the May 5, 2004 Office Action, the Examiner rejected all pending claims 1-14, 16-19, 21-33, 38-45 and 50-55 under 35 U.S.C. §103(a) as being unpatentable over Mravic et al. U.S. Patent No. 6,083,840 (hereinafter "Mravic") and/or Kaufman et al. U.S. Patent No. 6,063,306 (hereinafter "Kaufman").

In response, Applicants have hereby amended claim 1 (from which all remaining claims 2-14, 16-19, 21-33, 38-45 and 50-55 directly or indirectly depend) to recite:

> "1. A method for chemical mechanical polishing copper, barrier material and dielectric material, the method which comprises the steps of:
>
> ...
>
> c) providing **a second chemical mechanical polishing slurry** comprising **(i) 1-10 wt. % silica particles, (ii) 0.1-1.5 wt. % oxidizing agent,** and **(iii) 0.1-2 wt. % carboxylic acid,** having a pH in a range from about 2 to about 5, **wherein the amount of (ii) is not more than the amount of (iii),** and wherein said second slurry has a higher removal rate on said barrier material relative to a lower removal rate on said dielectric material and an intermediate removal rate on copper..."

The instant specification as originally filed describes on page 15, Table 3 various formulations of the second slurry that contain the oxidizer (i.e., KIO_3 formed by HIO_3 and KOH) in a range of 0.1 to 1.5 wt.% and the carboxylic acid (i.e., the iminodiacetic acid or IDA) in a range of 0.1 to 2 wt.%, while the oxidizer in each instance being present at a concentration not more than that of the carboxylic acid (IDA).

Therefore, claim 1 as amended is consistent with and fully supported by the instant specification as originally filed.

Neither Mravic nor Kaufman teaches or suggests a second chemical mechanical polishing slurry comprising (i) 1-10 wt. % silica particles, (ii) 0.1-1.5 wt. % oxidizing agent, and (iii) 0.1-2 wt. % carboxylic acid, having a pH in a range from about 2 to about 5, with the amount of (ii) being not more than the amount of (iii), as required by claim 1 and all its dependent claims 2-14, 16-19, 21-33, 38-45 and 50-55.

Mravic only discloses a second step slurry containing 15-30% abrasive (Table 3, column 8, line 31 of Mravic et al.) and a pH range of 9-11 (column 8, line 3 of Mravic et al.) for polishing of copper, tantalum and dielectric at approximately equal polishing rates (column 7, lines 44-53 of Mravic et al.).

Therefore, **Mravic does not provide any derivative basis for the second chemical mechanical polishing slurry as required by claims 1-14, 16-19, 21-23, 38-45 and 50-55**.

Kaufman discloses a second step slurry containing 0.3-30.0 wt.% oxidizing agent (column 8, lines 2-9), 0.1-5.0 wt.% complexing agent (column 8, lines 16-20), and optionally 0.01-1.0 wt.% film forming agent (column 8, lines 39-44).

Although the complexing agent of Kaufman may comprise a carboxylic acid, such as citric acid, lactic acid, tartaric acid, succinic acid, acetic acid, and oxalic acid (column 8, lines 12-13), Kaufman expressly states at column 8, lines 21-26 that:

> "It is important that **the second CMP slurry include a far smaller amount of complexing agent in comparison of the weight amount of oxidizing agent in the slurry**. The second CMP slurry should have **a oxidizing agent to complexing agent weight ratio greater than about 10, and preferably greater than about 25**." (emphasis added)

Such statement by Kaufman therefore **expressly teaches away** from a second CMP slurry that contains both an oxidizing agent and a carboxylic acid, with the amount of such oxidizing agent being not more than the amount of such carboxylic acid, as required by all the pending claims 1-14, 16-19, 21-33, 38-45 and 50-55 of the present application.

Therefore, Kaufman likewise fails to provide any derivative basis for the second chemical mechanical polishing slurry as required by claims 1-14, 16-19, 21-23, 38-45 and 50-55.

Claims 1-14, 16-19, 21-23, 38-45 and 50-55 thus patentably distinguish over both the Mravic and Kaufman references, and Applicants respectfully request the Examiner to reconsider, and upon reconsideration to withdraw, the rejections of such claims.

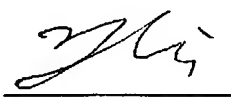
CONCLUSION

Based on the foregoing, claims 1-14, 16-19, 21-33, 38-45 and 50-55 as cancelled/amended herein are in form and condition for allowance. The Examiner therefore is respectfully requested to issue a Notice of Allowance accordingly.

No fee is rendered payable for this Response. Nevertheless, the Office is hereby authorized to charge any fees deemed necessary for entry of this Response to Deposit Account 08-3284 of Intellectual Property/Technology Law.

If any issues remain outstanding, incident to the formal allowance of the application, the Examiner is requested to contact the undersigned attorney at (919) 419-9350 to discuss same, in order that this application may be allowed and passed to issue at an early date.

Respectfully submitted,



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